

remove a target portion of the SiC outer surface portion. In short, the claimed invention, drawn to a semiconductor processing component having notably improved surface purity, is enabled through a material subtractive process.

The PTO continues to rely on Thilderkvist et al. and Kumar et al. for disclosure of purification of an outer surface portion of an SiC semiconductor processing component. While the prior art indeed teaches purification of an outer surface of a semiconductor component, purification is carried out by use of a sacrificial layer, in which a sacrificial layer is deposited on the component to undergo purification, followed by diffusion of impurities into the sacrificial layer and removal of the sacrificial layer. Diffusion is carried out by short (several minutes) of heat treatment. Essentially, the prior art teaches use of sacrificial layers to collect or “getter” contaminants from an outer surface of an SiC component.

Applicants have discovered that such gettering processes are ineffective to purify processing components to the impurity level claimed, notably, at 2X the bulk impurity level and below. In this respect, the attention of the PTO is drawn to the enclosed Rule 132 Declaration filed herewith.

The Declaration memorializes experiments carried out by Dr. Yeshwanth Narendar to investigate the effectiveness of gettering layers. As explained in the Declaration, use of a sacrificial layer to getter impurities, subjected to an extended purification treatment (12 hours at high temperature), was ineffective to achieve the claimed surface impurity level. Specifically, even after extended heat treatment to drive diffusible impurities into the sacrificial layer, surface impurity levels dropped from 5E18 atoms/cc to 7E17 atoms/cc. However, this post-treatment surface impurity level of 7E17 atoms/cc still represents a notably dirty outer surface compared to the bulk surface impurity level of 3.5E16 atoms/cc. That is, the post-treatment surface impurity level was found to be 20X the bulk impurity level, not even remotely close to the maximum 2X surface impurity level according to the claimed invention. Accordingly, Applicants unequivocally show that even if the teachings Thilderkvist et al. are extended to include prolonged purification, Thilderkvist et al. fail to even remotely approach the claimed invention.

While Applicants note that Thilderkvist et al. make passing reference to repeated cleaning, such repeated cleaning steps do not result in the claimed impurity level according to

Applicants' technical studies. At best, Thilderkvist et al. merely suggest or invite one of ordinary skill in the art to repeat the described process to achieve the desired purity; nevertheless, the described technology of use of a sacrificial layer to getter impurities is fundamentally inferior technology relative to the use of a material subtractive process to enhance surface impurity. It is believed that the technology of the prior art is limited in effectiveness by relying on diffusible impurities, including diffusion coefficients of such impurities. In contrast, the claimed invention is not limited as such, instead achieving purity through material removal.

For at least of the foregoing reasons, in view of the Rule 132 Declaration filed herewith, Applicants respectfully submit that the presently claimed invention would not have been obvious over Thilderkvist et al. in view of Kumar et al. Accordingly, withdrawal of the §103 rejection is respectfully requested.

2. Claims 10, 11 and 20 were rejected over Thilderkvist et al. in view of Kumar et al., in further view of additional secondary references. These additional secondary references fail to cure the deficiencies of the Thilderkvist/Kumar combination noted above. Accordingly, withdrawal of these rejections is respectfully requested as well.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims.

Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone the Applicants' undersigned representative at the number below.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

Date

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